REMARKS

The present invention is directed to a process for stabilizing the pH of a pulp suspension during stock preparation and the formation of paper.

It is requested that the Examiner reconsider and withdraw the rejection of claims 1-26 under 35 USC 103(a) as being unpatentable over Admitted Prior Art ("APA") at specification page 1, paragraphs 0002 and 0003, in view of Ostberg, with or without, GB patent 815,527, with or without, EP 0 281 273.

Applicants do not agree with the APA interpretations urged by the Examiner. They are not based upon labeled or acknowledged prior art *per se*, but rather, reflect applicants identification of prior art problems and deficient methodologies. Similarly, Applicants do not agree with the Examiner's interpretation of Ostberg for all of the reasons previously urged. However, the claims are amended herein to distinguish over the Examiner's interpretation of applicants' disclosure and Ostberg, and to favorably conclude the examination process.

The claims of the application have been amended to more readily distinguish over the cited prior art. Specifically, the claims have been amended:

a) to more clearly specify the feed combination, and

b) to limit the pH adjustment to an increase in the pH.

Thus, the amended claims define the alkali metal hydroxide feed and carbon dioxide feed combination as including a cooperation of the feeds which precludes the separate use of the intermediate pH adjusting effect of either individual feed component.

The claimed combination feed is neither disclosed nor suggested in Ostberg. In Ostberg, the pH lowering effect of the carbon dioxide is specifically utilized for improving the washing of the pulp and for providing the desired low pH to the paper mill, and the sodium hydroxide is separately used to increase the pH.

In Ostberg, the sodium hydroxide could not have been added in the cooperating combination with the carbon dioxide as defined in the claims. This is true because adding sodium hydroxide in such a combination with the carbon dioxide added in Ostberg would have destroyed the wash improving activity of the carbon dioxide which is the whole aim of the Ostberg process.

Ostberg therefore fails to suggest the claimed combination feed and provides no motivation for such a modification in view of the separate functions of the feeds therein. Moreover, it is not plausible to modify Ostberg to include a combined feed since it destroys the objectives therein.

The added clarifying "combination" terminology should be understood to mean that the feeds may be added separately, but that even when this is done, the addition must not be such that the first feed and then the other feed is used for a purpose which includes the utilization of the respective pH-increasing or pH-decreasing effect. A typical example of cooperating feeds according to the invention is the addition of a sodium hydroxide feed on one side of a pump and carbon dioxide on the other side of the same pump. Adding on either side of the pump is advantageous because the pressure in the pulp flow just before the pulp enters the pump is relatively low, and it is easy to add a liquid hydroxide feed to such a pulp flow. After the pump, the pressure is relatively high and adding a gas into the high-pressure pulp flow ensures good mixing and dissolution of the carbon dioxide gas feed into the pulp.

EP 0 281 273 is cited as teaching of the use of pipes to introduce chemicals into pulp. Obviously, such teachings fail to remedy the deficiencies noted above.

GB 815,527 is cited for its teachings as to the use of an aqueous solution of sodium hydroxide. Obviously, such teachings fail to remedy the deficiencies noted above.

In order to further distinguish the claimed process from the prior art, all of the claims have been amended to the special case wherein the pH of the pulp suspension provided to stock preparation is increased. One skilled in the art would not be expected to add carbon dioxide to such a pulp suspension when he wanted to increase the pH.

The further limitation of the claims to the special case wherein the pH of the pulp suspension is always increased when the buffering is increased is contrary to Ostberg teaching. That is, Ostberg did not desire to raise the pH and actively decreased the pH with carbon dioxide. Only by decreasing the pH did Ostberg obtain the noted buffering effect.

Increasing the pH is also contrary to EP 0 281 273. In the '273 teaching, the pulp initially has a pH of about 10-12 and the pH is decreased to a pH of about 7 with carbon dioxide. Thereafter, the pH is lowered further to a pH of about 4.5 with alum toward the end of the papermaking. There is no increase of the pH nor any addition of a cooperating combination in the '273 teaching.

It should be appreciated that as the pH is lowered to a value of about 4.5, there will be no buffering effect remaining in the pulp. This is true because the buffering HCO3 ions cannot exist in such a low pH and

change into the form of CO2 which as such do not provide any buffering.

Increasing the pH is also contrary to GB 815,527, which aims at countering a pH decreasing effect of the bleaching reagents in a chlorine dioxide bleaching reaction. The bleach ends at a lower pH then the initial pH, and in the subsequent steps, the pH is still further lowered so that the buffering capacity will be consumed. In the same manner as in the '273 teaching, the pH in the '527 teaching will in the end be such that no buffering will remain in the pulp towards the end of the process.

The terminology relating to "a substantial countering of the pH changing effect of the feeds" has been deleted from most of the claims as being redundant in view of the new definition of cooperating feeds and the increasing of the pH. Similarly, the terminology relating to the use of an excess of either feed to adjust (decrease or increase) the pH is no longer needed in view of the fact that the pH is now always increased in accordance with the claims.

All of the claims of record are directed to a method of stabilizing pH in paper making including:

increasing of alkalinity in stock preparation;

a combination of hydroxide and carbon dioxide feeds which cooperate without the separate uses of their respective intermediate pH effects;

a significant or substantial buffering effect;

an increase in pH; and

stabilization or maintenance of pH at a desired level throughout short circulation and formation of paper.

Even assuming, *arguendo,* the alleged APA and the propriety of combining the same with Ostberg alone, or in combination with the further cited secondary references, such combination or combinations do not render obvious the invention now set forth in the claims.

The Examiner's specific comments in respect to claims 14, 17, 19, 21 and 23 also fail to address or remedy the above noted deficiencies of the rejection.

It is emphasized that the Examiner has failed to ever address the specific recitations of claims 15, 18, 22 and 24. These claims are directed to the addition of specific amounts of carbon dioxide and alkali metal hydroxide consistent with the buffering objectives of the present invention. These combination feeds provide buffering in stock preparation to effect pH stabilization for typical systems encountered by applicants at the time of the invention.

For all the foregoing reasons, it is respectfully submitted that claims 1-26 presently of record are in condition for final allowance and such action is requested.

If there are any further fees required by this Amendment not covered by an enclosed check, or if no check is enclosed, please charge the same to Deposit Account No. 16-0820, Order No. 32107.

Respectfully submitted,

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